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United States Institute for Textile Research, Inc.

Vol. I December, 1931 No. 10

C O N T E N T S

The Textile Research Annual

Resolution on Death of Dr. Stratton

Promotion of Paid Research

Coming Meetings

Abstracts

Bibliography

Secretary's Temporary Office
65 Franklin St., Boston, Mass.

T. R. I. BULLETIN

An Official Publication of
United States Institute for Textile Research, Inc.

Vol. I December, 1931. No. 10

THE TEXTILE RESEARCH ANNUAL

Review For 1931 to be Published Early Next Spring

For the first time in the history of the textile industry a review of textile research, similar to annuals that have been published for some time for the chemical and other industries that are leaders in scientific research, is to be published by U. S. Institute, the first issue covering results for the year 1931. This initial issue will be dedicated to the memory of our late president, Dr. Samuel W. Stratton, and will bear the imprint of Technology Press of the Massachusetts Institute of Technology, Cambridge, Mass.

Publication of this Annual as a needed service to the industry was proposed last Summer by Dr. W. F. Edwards, then chairman of the committee on abstracts and bibliography, and upon recommendation of the Research Committee the idea was approved by the Executive Committee at its meeting June 16. Dr. Edwards' committee was authorized to prepare prospectus and plans that could be used in securing underwriting of cost of publication, and at the meeting of the Executive Committee Oct. 15, Dr. Stratton reported that the necessary underwriting had been provided for and that publication would be authorized, but, following his death shortly thereafter, no one could be found who knew of his plans for this financing.

M. I. T. Underwrites Publication Cost

The Secretary of U. S. Institute was instructed to investigate possible sources of the underwriting that our late President may have had in mind, and, while nothing could be located, he found that President K. T. Compton of M. I. T., was impressed with the value to the industry of such a work and with the management of its publication being a legitimate activity for Technology Press. Following a thorough investigation of the subject by his representatives President Compton recommended to his Executive Committee at its meeting Dec. 1 the authorization of "a special appropriation of $1,000 to underwrite the publication of Textile Research Progress under the auspices of United States Institute for Textile Research, to be printed by the Publications Department of the M. I. T., and to bear the imprint of the Technology Press for the M. I. T."

Editors and Publication Managers

The Executive Committee of U. S. Institute, at its meeting Dec. 4 in Boston, accepted the proposition submitted by President Compton of M. I. T., and adopted a resolution formally expressing their deep appreciation of this generous cooperation. The Committee also authorized compilation of the Annual by the committee on abstracts and bibliography as the board of editors, and with the editor and business manager of Technology Review supervising and managing other publication details. The board of editors is as follows: Prof. E. R. Schwarz, Mass. Institute of Technology, chairman; Dr. W. E. Emley, Bureau of Standards; E.D. Walen, Pacific Mills, Lawrence, Mass.; Prof. Louis A. Olney, Lowell (Mass.) Textile Institute.

Tentative Plans of Editors

The board of editors held their first conference in conjunction with the meeting Dec. 7 at the Lowell (Mass.) Textile Institute of the Research Committee. A volume of approximately 200 pages was planned, with a separate chapter for each subject and with the latter written in each case by recognized authorities. The volume will be carefully indexed and cross-indexed, and, in addition, will include an index of abstracts and bibliography published in T. R. I. Bulletin during 1931. It is hoped to have the Annual ready for distribution early next Spring, but as all associated in this work are contributing their services, and it is a new undertaking, it is not possible at present to name a definite publication date. The editors hope to present a prospectus of the Annual with list of contributors in the next issue of T. R. I. Bulletin.

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Resolution on Death of Dr. Stratton

Adopted by Council of American Association of Textile Chemists and Colorists

The following resolution, adopted by the Council of the American Association of Textile Chemists and Colorists, was accepted with thanks by the Executive Committee of U.S. Institute at its meeting Dec. 4:

"Whereas, Dr. Samuel Wesley Stratton, President of the United States Institute for Textile Research, died October 18th, 1931.

"And whereas, the United States Institute for Textile Research and the American Association of Textile Chemists and Colorists are allied in their aims and purposes,

"Be it resolved, that the Council of the American Association of Textile Chemists and Colorists hereby expresses to the officers and members of the United States Institute for Textile Research, its sincere regrets at the loss of their accomplished and most distinguished first President.

"And be it further resolved, that a copy of these resolutions be spread upon the records of the Council Meeting of the American Association of Textile Chemists and Colorists, and a copy sent to the Secretary of the United States Institute for Textile Research."

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PROMOTION OF PAID RESEARCH

Research Committee and Secretary Authorized to Engage in This Service

By vote of the Executive Committee at its meeting Dec. 4 "the Research Committee and Secretary are authorized to undertake to interest members of U. S. Institute and non-members in the financing of research on problems approved by the Research Committee, and under terms and conditions to be approved by the Executive Committee, the reports of results of such research when completed to be made available to members."

This action involves a change in method, but not in policy. U. S. Institute is authorized by its incorporation certificate "To promote, cultivate and facilitate scientific research," but heretofore these activities have been general in character. Continuance of this method means that ability to finance research must await a considerable increase in contributing memberships, or the accumulation of an adequate foundation fund. Meantime, as shown by the "Survey of Textile Research in the United States, 1931" there are "large available supplies of facilities and skilled personnel in commercial, educational and governmental laboratories " that are not being utilized in scientific textile research because in most cases no effort is being made to sell them, and in other cases the merchandising is inadequate.

Our late President believed that U. S. Institute could perform a useful service for these laboratories by selecting and promoting the financing of specific researches of a fundamental character. For the groups of manufacturers cooperating in such financing U. S. Institute will act in an advisory capacity in selecting and placing the work and also in coordinating and reporting results. From the start it has stood ready to act in these capacities, but now instead of waiting for the demand it will attempt to stimulate it for specific studies at a fairly definite cost.

Members of U. S. Institute will be given opportunity to cooperate in such researches before they are presented to non-members. Plans for two studies are now being drawn up, one pertaining to certain spinning qualities of cotton, and the other to the fulling and felting qualities of wool.

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COMING MEETINGS

The stated quarterly meeting of the Board of Directors will be held at the Chemists' Club, New York City, at 10 A. M., Friday, January 22, 1932.

The next meeting of the Research Committee will be held at the Chemists'Club, New York City, at 10 A. M., Thursday, January 21, 1932.

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CLASSIFIED INDEX
of
Abstracts and Bibliography
(Arranged Alphabetically by Major Subject)

Fibres (Synthetic and Natural) and Fibre Analysis — Page

Artificial Silk: Physical Properties of, and Their Relation to the Raw Materials and the Methods of Preparation. 8
Artificial Silks: X-Ray Investigation of. 9
Cellulose: Structure of the Crystal Lattice of. 6
Cellulose: Thermal Properties of and its Derivatives. 11
Cotton Fibres: Origin and Early Stages of Elongation. 6
Fibres: Identification of. 14
Fibres: Structure of Textile. 11
Fibres: Quantitative Estimation of Mixed. 5
Hair Keratin: X-Ray Interpretation of the Structure and Elastic Properties of. 10
Raw Silk: Comparative Analysis of the Composite Classification of. 14
Rayon: The Influence of Moisture upon the Strength and Stretch of. 13
Wool: Action of Sodium Sulphide on. 9

Yarns and Fabrics
Cellophane and Artificial Silk: Swelling by Caustic Soda. 8
Porosity: A Primary Property of Textiles 7
Regenerated Cellulose Rayon: Effect of Tension on the Dye Absorptive Properties of. 5
Sanforizing Process. 10
Sizing and Finishing Materials: Identification of. 13

Chemical and Other Processing (Not Otherwise Classified)
Alkali Celluloses: Textile Fibres, Yarns and Fabrics. 7
Azo Dyes Derived from Homophthalimide. 7
Black Sulphur-Dye Waste: Precipitation of. 9
Cellulose: Action of Alkali on. 11
Cellulose: Action of Sodium on in Liquid Ammonia. 12
Cellulose: Hygroscopic Moisture of. (II) 8
Cellulose: Solubility of in Caustic Soda. 8
Cellulose Acetate: Some Researches on Softeners for. 13
Cellulose Esters: Viscosity of. III. Viscosity of Cellulose Nitrate Solutions in Mixed Solvents. 5
Dry Cleaning Soaps: The Solubility of. 13
Organic Solvents: Classification of Modern. 7
Ultra-Violet Light: Resistance of Coloring Matters to. 8

Research Methods and Apparatus
Cellulose: Detection of Oxy- and Hydro-. 9
Cellulose: Determination of. 10
Fibres: Test Apparatus for Stretch and Strength Measurements of. 13
Light Fastness: Report of Sub-Committee on. 13
Organic Fibres: Determination of Content of in Asbestos Products. 12
Textile Fibres: Rapid Determination of the Moisture Content of (Silk). 11
Ultra-Violet Light: The Use of a New Analytical Filter as an Accessory with the for Fabric Research. 13

Economics and Miscellany
Silk Industry: Research in the. 14

ABSTRACTS

EFFECT OF TENSION ON THE DYE ABSORPTIVE PROPERTIES OF REGENERATED CELLULOSE RAYON.- B. L. Hathorne.
American Dyestuff Reporter, Oct., 1931, P. 679-680, 704.

This is a short but timely discussion of the effects of tensioning on the evenness of dyeing in rayon fabrics made of viscose yarns. The author's conclusions are as follows: The experiments clearly indicate that tension applied to regenerated cellulose rayons during the dyeing operation retards dyestuff penetration of the great bulk of all substantive dyestuffs altho this retarding effect is not uniformly pronounced for all dyestuffs.

Whether or not there may be some dyestuffs that do not react as the above experiments would indicate, we cannot state, as we have not gone to the extent of testing all known substantive dyestuffs in the above described manner.

Our work clearly indicates that uneven tensions applied to rayon yarns during fabric manufacturing processes (spooling, beaming, warping, weaving, etc.), can seriously affect the level dyeing properties of the rayon treated, particularly when the treated fabrics are dyed in such a manner that uneven tensions existing in the fabric must be maintained throughout the dyeing operation. (S)

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VISCOSITY OF CELLULOSE ESTERS. III. VISCOSITY OF CELLULOSE NITRATE SOLUTIONS IN MIXED SOLVENTS.- K. Atsuki and M. Ishiwara.
J. Cellulose Inst., Tokyo, 1931, 7, 191-195; cf. B., 1931, 479.

Mathematical expressions are deduced to show the effect of concentration of the cellulose nitrate on the relations between the viscosity of the solution and the composition of the mixed solvent ($COMe_2$-H_2O). Results of viscosity measurements on 2% solutions of a nitrocellulose containing 12.18% N in solvents of various compositions of $COMe_2$ and H_2O are in good agreement with the values calc. from these equations. (Copied complete from the J. S. C. I. Oct. 23, 1931, Abstract Section) (S)

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QUANTITATIVE ESTIMATION OF MIXED FIBRES.- P. Krais and H. Markert.
Leipziger Monatsch. Textilind.,1931, 46, 169-171.

A new method is described for the quantitative separation and estimation of cotton, wool, artificial silks and natural silk in mixed fabrics, in which treatment with calcium thiocyanate solution results in complete solution of the natural and artificial silks, whilst mercerized and unmercerized cotton and wool are unattacked. A solution containing 100% calcium thiocyanate by weight is filtered through a copper sieve (2,500 mesh per sq. cm.) and 200 c. c. introduced into a 500 c. c. flask immersed in a water bath at 70° C. The material is scoured, dried, hung in an atmosphere of 65% R. H. and 1.5 g. cut into pieces 1 cm. long and entered into the solution. The whole is heated for one hour in the boiling water bath with mechanical agitation. Disintegration of the fibres must be avoided. The contents of the flask are next filtered through the dry copper sieve, the residue pressed well with a glass rod, washed for 1/4-1/2 hour in running water, removed by hand, squeezed well, dried at 110°C., and finally conditioned at 65% R. H., and weighed. A correction is necessary to counter balance the 2-4% loss due to the removal of natural impurities, e.g., pectins. (Copied complete from the Abstract Section, J. Soc. Dyers and Col., Vol. 47-10, Oct., 1931) (S)

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COTTON FIBRES - ORIGIN AND EARLY STAGES OF ELONGATION.- Wanda K. Farr. Contributions from Boyce Thompson Institute, Vol. III-3, P. 441-58.

Reprint of the first of a series of papers covering the study of the entire period of cotton fibre growth, undertaken as an aid to future classification of mature fibres. Several pages are devoted to a discussion of previous work itemized in a bibliography of 19 items and the paper continues with a description of the method of test and a number of excellent photomicrographs, tables and diagrams. The author's summary follows:

Observations of the early stages of elongation of fibres from the seed-coat of Gossypium hirsutum in mounts of fresh material show wide variation in fibre length.

The appearance of the cytoplasm indicated that growth initiation had taken place more recently in the shorter than in the longer fibres.

The thirty-two-fold increase in surface area of the seed during the first twenty days, in comparison with the two-fold increase in length of the transverse axes of epidermal cells during the same period, indicates that cell enlargement is not alone responsible for the tangential extension of the epidermal layer of the seed-coat.

Large numbers of dividing cells in the epidermal layer from the date of flowering to the twelfth day following, reveal the chief method of extension of the epidermal covering.

A slight decrease in number of dividing cells after the twelfth day, and the presence of still fewer after the fifteenth day from flowering, suggest a progressive retardation in cell division which may begin as early as the tenth day. These observations are limited to median cross-sections of the seed and are not representative of the entire surface.

Early stages of fibre elongation from epidermal cells which were apparently daughter cells of recent divisions furnished direct evidence that fibres may originate from cells which are not yet formed upon the date of flowering.

The nutrition of the fibre in any other fashion than through its basal connection with the seed seems to be quite unlikely. Median sections of the bases of fibres in all stages of development show neither extreme attenuation nor extreme constriction. An examination of bolls in all stages of development failed to reveal the presence of any liquid or semi-liquid substance in the boll cavity. (S)

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STRUCTURE OF THE CRYSTAL LATTICE OF CELLULOSE.- W.T.Astbury and T.C.Marwick. Nature, 1931, 127, 12.

Investigation of the available data for cellulose and the sugars indicates that the six-atom sugar ring is associated in the crystal state with certain linear dimensions, one of which usually corresponds to one of the axial lengths of the unit cell. The great advantage of this point of view is the way it links up the structures of natural and mercerized celluloses, in keeping with what is already known of the changes in other dimorphous crystals. Although the evidence adduced from intensity measurements does not support this theory, it is unwise to argue that any proposed structure of cellulose accounts for the paucity of X-ray reflections, when a similar phenomenon is exhibited by other natural fibres, e. g., silk and hair, composed of quite different molecular units. (Copied complete from Soc. of Dyers and Col., March, 1931, Abstract Section) (S)

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POROSITY: A PRIMARY PROPERTY OF TEXTILES.- N. H. Chamberlain.
J. Soc. Dyers & Col., Vol. 47-10, Oct., 1931, P. 289-293.

A brief article, Part I of which gives a definition of porosity which the author states to be the bulk density multiplied by a constant, and proceeds to the measurement of thickness and discussion of the milling of wool fabrics. Part II by H. J. Woods is largely a discussion of Schofield's mathematical work (the original article by Schofield appeared in the J. Soc. Dyers & Col., Vol. 46, 1931, P. 368-372, 401.) There is also included in Vol. 47-10 a reply by Schofield to Chamberlain and Woods. He recognizes the value of Mr. Wood's comments and states that they have made his experiment all the more important. (S)

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CLASSIFICATION OF MODERN ORGANIC SOLVENTS.- E. Clayton and C. O. Clark.
J. Soc. Dyers and Col., Vol. 47-9, Sept., 1931, P. 247-253.

This is Part II of the article and is concerned with the applications of organic solvents to the textile and allied industries.

Organic solvents in general use maybe classified as follows: (1) Hydrocarbons, Hydrogenated Derivatives, and Heterocyclic compounds. (2) Sulphonic Acids and Sulphuric Acid Esters. (3) Halogenated Compounds. (4) Alcohols and Phenols. (5) Glycols and their Derivatives. (6) Esters. (7) Aldehydes. (8) Ketones. (9) Ethers. (10) Miscellaneous Solvents.

In adopting this classification, it has been considered advisable to include the derivatives of certain substances in the same class as the parent bodies rather than in their own chemical classes. As the subject has been dealt with mainly from the view-point of the textile chemist many important uses of solvents in other industries are not mentioned. (S)

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TEXTILE FIBRES, YARNS, AND FABRICS. ALKALI CELLULOSES.- G. Champetier.
Compt. rend., 1931, 192, 1593-1595.

Alkali-cellulose, obtained by steeping dry cotton linters in caustic soda solution of known concentration for 24 hours at 18° - 20° C., was dried progressively, and samples removed at various stages. The total quantity of soda was plotted against the quantity of water in each sample, and the amount of fixed alkali remaining in the cellulose, after all the mother liquor had been removed, was determined from the curve by extrapolation. This experiment was repeated using sodium hydroxide of different concentrations, and the fixed alkali plotted against the original concentration of the solution. The curve exhibited four peaks corresponding to the following alkali-celluloses: $2C_6H_{10}O_5.NaOH$; $3C_6H_{10}O_5.2NaOH$; $4C_6H_{10}O_5.3NaOH$; and $C_6H_{10}O_5.NaOH$. The results indicate that the fixation of sodium hydroxide by cellulose proceeds through a discontinuous series of definite molecular compounds. (Copied complete from J. Soc. Dyers and Col., Vol. 47-9, Sept., 1931, Abstract Section, P. 271-272.) (S)

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AZO DYES DERIVED FROM HOMOPHTHALIMIDE.- A. Meyer and R. Vittenet.
Compt. rend., 1931, 193, 344-346.

Homophthalimide is coupled with diazotized sulphanilic, m-xylidine-sulphonic, B-naphthylamine-6:8-disolphonic, naphthionic, and 1-amino-B-naphthol-4-sulphonic acids yielding the corresponding azo dyes (Na salts). Substantive dyes (shades on cotton given) are prepared by coupling tetrazotized benzidine, tolidine, and dimethoxybenzidine first with 1 mol. of an aminonaphthol or a naphtholsulphonic acid in acid or alkaline media, and then with 1 mol. of homophthalimide in alkali. (Copied complete from Abstract Section, J. S. C. I., Oct. 23, 1931). (S)

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RESISTANCE OF COLOURING MATTERS TO ULTRA-VIOLET LIGHT.- G. A. Bravo.
Boll. Uff. R. Staz. Sper. Pelli. e Mat. con., 1931, 9, 210-220.

The advantage of testing colors under the influence of ultra-violet light (this Jour., 1931, 47, 122) instead of sunlight are again stressed. In this way colors may be more accurately, more quickly, and more easily compared.

A method suitable for works practice, based upon the observations of Barker (this Jour., 1927, 43, 253) is described, and the degradation curves for various dyes are given. (Copied complete from Abstract Section, J. Soc. Dyers & Col., Vol. 47-9, Sept., 1931.) (S)

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PHYSICAL PROPERTIES OF ARTIFICIAL SILK, AND THEIR RELATION TO THE RAW MATERIALS AND THE METHODS OF PREPARATION.- E. Viviani.
Giorn. Chim. Ind. Appl., 1930, 12, 519-536.

Amongst the problems discussed are the real and apparent specific gravity and covering power of the fibre; ductile resistance, elongation, and elasticity; the graph relationship between tenacity and elongation; a detailed study of the influence of the various manufacturing stages on the characteristics of the fibre; methods for controlling its uniformity. Methods are described for determining the viscosity of cellulose and of cotton; maturing alkali-cellulose in the absence and presence of oxygen; and measuring the absorption of oxygen during the latter process. (Copied complete from Jour. Soc. Dyers and Col., March, 1931, Abstract Section.) (S)

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SWELLING CELLOPHANE AND ARTIFICIAL SILK CLOTH BY CAUSTIC SODA.- K. Tanemura and S. Miyoshi.
J. Soc. Chem. Ind., Japan, 1930, 33, 431-432B.

Maximum swelling of cellophane and artificial silk cloth occurs with 10% and 8-13% caustic soda solutions respectively, and swelling is diminished in presence of ethyl alcohol, glucose, and other solutes. Addition of sodium chloride, carbonate, or sulphate to the caustic soda rapidly diminishes its swelling action up to a certain point, after which further addition of salt has no effect. The depressing influence of cations of alkali metals, and anions upon the swelling of cellophane and artificial silk cloth by caustic soda is tabulated. (Copied complete from J. Soc. Dyers and Col., Abstract Section, March, 1931.) (S)

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SOLUBILITY OF CELLULOSE IN CAUSTIC SODA.- T. Nakashima.
J. Soc. Chem. Ind., Japan, 1931, 33, 388-390B.

When cotton and sulphite-cellulose are extracted with successive portions of 10% caustic soda solution in an atmosphere of hydrogen, to avoid formation of oxycellulose, the solubility gradually diminishes and finally becomes constant. The high initial solubility is probably due to dissolution of impurities such as hemicelluloses. (Copied complete from the J. Soc. Chem. Ind., Abstract Section, May, 1931.) (S)

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HYGROSCOPIC MOISTURE OF CELLULOSE. II.- S. Oguri and S. Terui.
J. Soc. Chem. Inc., Japan, 34: 182B, June, 1931.

The moisture regain of standard cellulose was measured with a silica spring balance at various humidities at 12, 16, 20, 24 and 28 degrees C. Contrary to the results of numerous investigators, the moisture regain at any given relative humidity is independent of the temperature. (Copied complete from Eastman Kodak Co. Abstract Bulletin, Oct., 1931.) (S)

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PRECIPITATION OF BLACK SULPHUR-DYE WASTE.- W. Rudolfs and W. H. Baumgartner. Ind. Eng. Chem., 1931, 23, 906-908.

For the clarification of spent liquors from Sulphur Black dyebaths before discharge into the sewers, $FeCl_3$ followed by sufficient HCl to produce a final pH of about 6.6-7.7, preferably at raised temp., appears to cause rapid and complete clarification and sedimentation without evolution of H_2S or precipitation of free S. Addition of $FeSO_4$ and H_2SO_4 is likewise effective, and activated sludge is of limited application. (Copied complete from J. S. C. I., Oct. 23, 1931, Abstract Section.) (S)

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X-RAY INVESTIGATION OF ARTIFICIAL SILKS.- E. Levin and F. M. Rowe. Rayon Record, 1930, 4, 1283.

The authors review the progress made in the application of Rontgen-spectographic methods to the examination of cellulose and artificial silks. These fibres consist of crystalline aggregates and the difference between natural and artificial fibres depends upon the arrangement of the crystallites within the fibre. Photo-micrographs of Lilienfeld silk suggest that its high tenacity is due to the parallel arrangement of the cellulose crystallites within the fibre. The use of Rontgen rays in differentiating between the various textile fibres, is described. Cuprammonium and viscose silks give identical X-ray photographs. The Rontgen diagrams are unaffected by the presence of weighting material or coloring matter. (Copied complete from J. Soc. Dyers and Col., Abstract Section, March, 1931.) (S)

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ACTION OF SODIUM SULPHIDE ON WOOL.- J. B. Speakman. J. S. C. I., 1931, 50, 2-7T.

A solution of sodium sulphide does not eliminate the elastic phase in wool; it has less action on the cuticle than on the cortex. The reaction between wool and sodium sulphide is partly reversed by removal of the reagent with water. The permanent set produced by steaming stretched fibres is removed by sodium sulphide and sodium hydroxide solutions. It is considered that the disulphide group in wool is normally masked by an anhydride linking. Wool treated with sodium sulphide until it shows a loss in weight as high as 57%, has the same affinity for water, up to 75% humidity, as untreated wool. It is concluded, therefore, that the micelles of the wool fibre are lamellae, which are readily attacked at the edges by sodium sulphide, leaving the surface mass ratio unaltered. The disulphide linking probably lies in a plane making an angle with the main faces of the micelles. (Copied complete from Abstract Section, J. Soc. Dyers & Col., March,1931) (S)

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DETECTION OF OXY- AND HYDRO-CELLULOSE.- Anon. Mitt. Materialpruf., 1931, 142.

Owing to the similarity in behavior of oxy- and hydro-cellulose, none of the known qualitative tests is capable of distinguishing between the two compounds in woven goods. The most sensitive tests are the methylene-blue, Prussian-blue, and the ammoniacal silver nitrate methods, particularly the last. Fats and waxes do not interfere with the tests, but the degradation products of starch, lignified constituents, and pectin should be removed before testing; if this is not possible, the defects in the cloth can be detected only by strength tests. (Copied complete from the Abstract Section, J. Soc. Chem. Industry, May, 1931.) (S)

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X-RAY INTERPRETATION OF THE STRUCTURE AND ELASTIC PROPERTIES OF HAIR KERATIN.- W. T. Astbury and H. J. Woods.
Nature, 1930, 126, 913-914.

Animal hairs can give rise to two X-ray fibre photographs, according to whether they are stretched or unstretched, and the change from one to the other corresponds to a reversible transformation between a- and B-keratin. Investigation of the elastic properties of hair from its X-ray, and chemical and physical data, suggests a skeleton of the keratin complex consisting of a peptide chain folded into a series of hexagons, with the precise nature of the side links as yet undetermined. This skeleton explains why the main periodicity in unstretched hair corresponds with that of cellulose, chitin, etc., and why natural silk does not exhibit the long range elasticity of hair, as well as the lubricating action of water and steam on the latter, and the resistance of keratin to solvents and enzymes. (Copied complete from Abstract Section, J. Soc. Dyers and Col., March, 1931.) (S)

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DETERMINATION OF THE CONTENT OF ORGANIC FIBRES IN ASBESTOS PRODUCTS.- Anon.
Mitt. Materialpruf., 1931, 141-142.

The usual organic fibres employed in making asbestos string, board or paper are cotton and silk, the total content of which cannot be determined by loss on ignition as the actual loss on ignition of asbestos itself varies considerably with the variety. Good results are, however, obtained by dissolving out the silk and cotton with cuprammonium solution and weighing the washed residue. For the determination of the silk content the mixture is boiled with dilute sodium hydroxide solution, washed, dried, and weighed; the residue is then treated with cuprammonium solution to extract the cotton and again washed, dried and weighed. The difference between these two weights plus 3.5% of this difference (allowance for the cotton dissolved in the sodium hydroxide solution) gives the cotton content, and the difference between this and the sum of the cotton and silk previously determined gives the silk content. (Copied complete from Abstract Section, J. Soc. Dyers and Col., March, 1931.) (S)

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SANFORIZING PROCESS.- Sanford L. Cluett.
Melliand Textile Monthly, Vol. III-9, Dec., 1931, P. 760-766.

The author's abstract reads as follows: The paper describes a machine that will treat a fabric so that its dimensions in warp and filling will be what is desired after the fabric is subjected to laundry washing or other cleaning process. The causes of the shrinkage of a fabric when subjected to full laundry treatment being mostly mechanical, an effective treatment to prevent shrinkage may be found in some process of mechanically rearranging the fibres of the fabric (including changing the count of warp and filling) to the same extent that the fibres would rearrange themselves if subjected to a full laundry washing. Data are given of characteristic runs of different fabrics in the Sanforizing process. (S)

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DETERMINATION OF CELLULOSE.- K. Kürschner and A. Hoffer.
Chem.-Ztg., 1931, 55, 161-163, 182-184.

One g. of cellulosic material is distilled under reflux on a water-bath with a mixture of 20 c.c. of 96% alcohol and 5 c.c. of concentrated nitric for one hour, and, after removal of the liquor by decantation, is heated for for a further hour with another 25 c.c. of alcoholic acid. The crude cellulose is then filtered, washed with alcohol and water, dried, and weighed; it is tested for lignin and pentosans with phloroglucinol hydrochloride and, if the former be present, the extraction is repeated until the cellulose is

freed from ligin. The method was applied to a large number of cellulose-bearing materials with satisfactory results, the reagent having no effect on the cellulose. A numerical relationship was found to hold between the amount of pentosans originally present in the material and that remaining in the cellulose after extraction. (Copied complete from Abstract Section, J. Soc. Chem. Industry, May, 1931.) (S)

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THERMAL PROPERTIES OF CELLULOSE AND ITS DERIVATIVES.- E. Heisenberg.
Cellulosechem., 1931, 12, 159-162.

The heat of combination of cellulose derivatives can be calculated from the heat of combustion of the cellulose itself and its derivatives, and provides some indication of the tenacity with which the individual micelles are attached to one another within the fibre. Calorimetric investigation of a number of aliphatic esters indicates that the heat of combustion increases with the number of carbon atoms in the acid mol., and is inversely proportional to the degree of esterification. Viscose and cellulose acetate silks spun under tension have a higher heat of combustion than those spun without tension. (Copied complete from Abstract Section, J. Soc. Dyers and Col., Vol. 47-10, Oct., 1931.) (S)

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RAPID DETERMINATION OF THE MOISTURE CONTENT OF TEXTILE FIBRES (SILK).-E.Einecke.
Z. anal. Chem., 1931, 85, 45-50.

The increase in length of the silk on drying is proportional to the moisture content for the same silk but varies for different silks. Twenty-five parallel strands of silk are passed through an electrically heated horizontal tube and fixed at one end to a stationary clamp, the other end being passed over a small pulley attached to a lever and tied to a 10-g. wt. The extension of the silk threads moves the lever over a scale on which the extension is magnified in the ratio 60:1. The drying tube is heated to 135° over a period of 5 min., and from the observed extension the H_2O content is obtained by reference to a graph previously constructed from observations made on the same silk with different moisture contents. (Copied complete from Abstract Section of J. S. C. I., Oct. 23, 1931.) (S)

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ACTION OF ALKALI ON CELLULOSE. IV. MECHANISM OF OXIDATION OF ALKALI-CELLULOSE IN RIPENING.- K. Atsuki and H. Sobue.
J. Soc. Chem. Ind., Japan, 1930, 33, 511-513B; cf. B., 1931, 107.

The chemical reactions occurring between cellulose and alkali are considered to be represented by the following equations:
(1) $R.CH+Na^+ + OH^- + H_2O = R.ONa + 2H_2O$; (2) $R.OH+NaH_2O^+ + OH = R.OH,NaH_2O^+ + OH^-$; (3) $R.OH,NaH_2O^+ + OH^- = NaH_2O^+ + R(CH)_2-$; (4) $R.CH,NaOH = R(CH)_2- + Na^+ = RO- + NaH_2O^+$.

Reactions (1) and (2) take place with concentrations of alkali at or below that required for mercerizing, respectively, and (3) and (4) occur in more concentrated alkali solutions, the cellulose complex taking on a negative charge, whereby oxidation, which is stated to be the most important chemical reaction in ripening, readily occurs. (Copied complete from Abstract Section, J. Soc. Chem. Industry, May, 1931.) (S)

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STRUCTURE OF TEXTILE FIBRES.- V. Bossuyt and G. Chaudron.
Compt. rend., 1931, 192, 1050-1053.

Textile fibres, particularly linen, exhibit transverse markings, visible in polarized light, and regarded hitherto as flaws originating from the breaking process during retting. This assertion is now disproved because fibres isolated from the stalk by treatment with a neutral aqueous solution

of saponin also exhibit transverse markings. When a fibre is treated with 25% caustic soda under tension, the continuous fibrillar structure can be observed. This does not agree with the results of other investigators who attribute the markings to the formation of crystallites by depolymerization of the cellulose. Actually, examination under crossed Nicols of the fibres treated with caustic soda indicates that the markings appear as transverse creases in the outer layer of the fibre. Application of tension to a slightly swollen fibre removes the markings, which reappear when the tension is released. (Copied complete from the Abstract Section, J. Soc. Dyers and Col., Vol. 47-10, Oct., 1931.) (S)

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ACTION OF SODIUM ON CELLULOSE IN LIQUID AMMONIA.- P. C. Scherer, Jr. and R. E. Hussey.
J. Amer. Chem. Soc., 53: 2344, June, 1931.

By observing the action of sodium on cellulose in liquid ammonia the authors are led to the conclusion that cellulose behaves in ammonia as a typical tribasic alcohol since: (1) The amount of hydrogen evolved from a weighed quantity of sodium reacting with cellulose corresponds to the reaction, $ROH + Na = RONa + 1/2\ H_2$. (2) The reaction product conforms to tests applicable to soda cellulose prepared in the usual manner. (3) No appreciable amount of sodium amide was formed, which would be the case if the sodium had reacted with the solvent. No more than three atoms of sodium per $C_6H_{10}O_5$ group react; the first atom enters the molecule quickly, the second and third more slowly. (Copied complete from Abstract Bulletin, Eastman Kodak Co., Oct., 1931.) (S)

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BIBLIOGRAPHY

IDENTIFICATION OF SIZING AND FINISHING MATERIALS.
American Dyestuff Reporter, Oct. 26, 1931, P. 690-94.

Tentative report of Sub-Committee of the American Association of Textile Chemists and Colorists on standard methods of determining sizing and finishing materials in textile fabrics, including silk weighting, and is stated to be entirely provisional and not intended for re-publication elsewhere in its present form. A tabular statement of the chemical reaction of sizing and finishing materials with various reagents is included. (S)

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TEST APPARATUS FOR STRETCH AND STRENGTH MEASUREMENTS OF FIBRES.- Katsumoto Atsuki.
Kunstseide, Vol. XIII-II, Nov., 1931, P. 392-393.

An article by Prof. Katsumoto Atsuki of the Imperial University of Kyoto, Japan, who has designed and built an apparatus for fibre testing which permits mechanical measurement of fibres and records the results photographically. Diagrams showing the construction of the instrument and typical charts are included. The article is a translation from the Japanese into German by Dr. Roos. (S)

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USE OF A NEW ANALYTICAL FILTER AS AN ACCESSORY WITH THE ULTRA-VIOLET LIGHT FOR FABRIC RESEARCH.- Herbert W. Ellinger.
Kunstseide, Vol. XIII-11, Nov., 1931, P. 407-408.

A brief description of a less expensive filter attachment for the quartz lamp together with a brief discussion of fluorescence analysis. (S)

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INFLUENCE OF MOISTURE UPON THE STRENGTH AND STRETCH OF RAYON.- Kurt Bohler.
Kunstseide, Vol. XIII-11, Nov., 1931, P. 397-399.

A brief description of experiments showing variations of stretch and strength in 180 denier rayon through variations of from 4 to 12 1/2% regain. The article points out various practical applications of the results. (S)

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THE SOLUBILITY OF DRY-CLEANING SOAPS.- C. L. Bird.
J. Soc. Dyers & Col., Vol. 47-9, Sept., 1931, P. 254-258.

The solubility of the potassium and sodium soaps of oleic, stearic, and palmitic acids in White Spirit, in presence of (a) free fatty acid, (b) industrial methylated spirit (64 O.P.), and (c) water, has been determined. (S)

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SOME RESEARCHES ON SOFTENERS FOR CELLULOSE ACETATE.- Heinrich Messer.
J. S. C. I., Vol. 50-41, Oct. 9, 1931, P. 386T-387T.

The necessary characteristics of a satisfactory softener are outlined and the article continues with a description of certain researches to determine the best type of softener. It is stated that much of the work has been hindered by obstructionist patents the major of which are of no value since they contain no directions for the manufacture of the softener they claim to describe. (S)

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REPORT OF SUB-COMMITTEE ON LIGHT FASTNESS.- Wm. H. Cady and Wm. C. Smith.
American Dyestuff Reporter, Nov. 23, 1931, P. 754-758.

An editorial summary states that duplicate sets of samples from 40 selected dyeings were exposed in the Fade-Ometer with a plain glass globe for one set and a globe of Corex-D glass for the other set. Comparisons of the faded samples indicate that the use of a Corex-D globe instead of a plain glass globe will not materially affect the results of fastness tests. (S)

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RESEARCH IN THE SILK INDUSTRY.- Daniel E. Douty.
American Silk Journal, Dec., 1931, P. 44-46.

This is a brief outline of the possibilities in research for the proposed silk institute and is an address delivered at the National Silk Convention the week of November 14, 1931. Mr. Douty outlines 20 research subjects undertaken at the United States Testing Company, a large proportion of which involved optical equipment. The United States Institute for Textile Research is mentioned and it is stated that substantial and continuing support is still lacking for this body. (S)

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COMPARATIVE ANALYSIS OF THE COMPOSITE CLASSIFICATION OF RAW SILK.- W.P.Seem.
Melliand Textile Monthly, Vol. III-9, Dec., 1931, P. 749-752.

The first of a series of articles concerned with silk classing as adopted by the Japanese Government Conditioning House, May, 1931, with the progress report proposed June, 1931, by The Silk Association of America, with a presentation of the principles embodied in a composite classification. (S)

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THE IDENTIFICATION OF FIBRES.(cont'd.),- H. B. Gordon.
Melliand Textile Monthly, Vol. III-9, Dec., 1931, P. 734-736.

This article discusses wool briefly. Four good photographs showing fine wool, medium, coarse wool and shoddy are included. (S)

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